Algebra Core Curriculum Map

	Standard	Content Objective	Process Standard/Objective	Suggested materials/strategies
September	Number and Operation Algebra Number and Operation Algebra	**1.2.1-** Compare and find approximate locations of rational numbers on a number line **1.1.3, 1.3.2, 1.3.3 -** Apply properties and operations in simplifying rational numeric decimal, fraction, percent, and exponential expressions including integer exponents **1.3.3 -** Use physical models and calculators to review perfect squares and square roots, including variable expressions **1.3.1, 1.3.2 -** Introduce irrational numbers using physical models, number line and patterns to develop a sense of "betweenness." Classify numbers as rational or irrational **2.1.1 -** Write Algebra expressions to model and generalize visual patterns, manipulative patterns, numeric patterns, and data sets A. **1.1.1, 1.1.2, 1.1.3** - Extrapolate values using these algebraic expressions B. **1.2.2, 1.3.2 -** Simplify algebraic expressions using properties, e.g., 2x +7–3x, 3(4x+2), (a+b) – (4a+b) **2.2.7 -** Simplify simple algebraic exponential expressions including those with integer exponents.	**Problem Solving:** use appropriate methods for computing, make a model, draw a diagram or picture, eliminate possibilities, estimate solutions to determine reasonableness, find a pattern **Reasoning/Proof:** examine various patterns, make conjectures, draw reasonable conclusions **Communication:** use precise language and notation, organize and consolidate mathematical thinking, clearly express ideas verbally and in writing, group discussion **Connections:** establish connection between physical models, diagrams and symbols, formulate real-world applications **Representation:** represent verbally, numerically, algebraically, use technological representations	number line, calculator apps, Student Formations, cooperative structures paper folding, pennies, M and M's, exponential growth activities , calculators Color Tiles or centimeter cubes, number line, develop tables, calculators Color Tiles, centimeter cubes, number line, calculators, CMP (Prentice Hall) Venn diagrams, calc apps, Algebra Blocks or centimeter cubes or any counter chip, graph paper Pattern Blocks, AlgeBlocks, area and perimeter, calculator tables, data sets, numeric patterns such as sequences, triangular and square numbers, written expressions
October	Algebra Algebra, Measurement and Data Analysis	**2.1.1 -** Use a variety of real world or student created data sets to write one variable equations. **2.2.2 -** Solve multi-step one variable equations including algebraic first degree proportions and absolute value equations using: A. Guess and check B. Manipulatives C. Technology D. Algebraically **2.1.1 -** Represent real world situations using inequalities **2.2.2 -** Solve multi-step one variable inequalities and graph solutions on a number line **2.1.2, 2.3.4, 4.1.3, 5.1.1 -** Write Algebraic equations to represent and generalize linear relations derived from manipulatives, geometric, and other visual models and data sets. Find appropriate domain and range	**Problem Solving:** use manipulatives, guess and check, solve a simpler problem, choose appropriate operation, work backwards, use proportional reasoning, choose appropriate operations, make a model or simulation **Reasoning/Proof:** explain and justify problem solving procedures, link problem solving to the sequence of steps, draw reasonable conclusions **Communication:** employ precise language to justify reasoning, express ideas clearly **Connections:** formulate real-world situations, make a connection between models and mathematical expressions and procedures **Representation**: use physical models and appropriate symbolic notations, represent verbally, numerically and algebraically	Hands-On-Equations, counter chips, AlgeBlocks, manipulatives, real world problems, geometric models using color tiles, centimeter cubes, graph paper calculators, Box Cars and One-Eyed Jacks Calculator applications, CMP Resources: The Super Source Patterns and Functions, Connected Math Projects series from Prentice Hall Variables and Patterns, Navigating Through Algebra from NCTM, Connect to NCTM Standards from Creative Publications Use: polygon trains, building stairs, squares, borders, towers, and other student created physical models, tables, data sets, simple interest

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November	Algebra, Measurement Algebra	**2.2.2, 4.1.3 -** Solve real world problems involving constant rates of change, e.g. rates of travel, wages, cell phone costs, simple interest **2.1.4, 4.1.1, 4.1.3 -** Review slope as a rate of change using A. **4.1.2** Real world problems including manipulatives B. Technology C. **2.3.11, 4.1.2 -** Direct Variation, e.g. wages, rates of travel and interest D. **3.2.3, 4.1.2 -** Measurement/geometric ratios **2.3.1-** Identify the slope of a line when given A. A set of two ordered pairs B. A table of values C. The graph of a linear function D. The equation of a linear function **2.3.3 -** Identify horizontal and vertical lines from given equations **2.3.10, 4.1.3 -** Determine and explain the meaning of intercepts using real world examples	**Problem Solving:** use manipulatives, use proportional reasoning, make a model or simulation, estimate to determine reasonableness, solve a simpler problem, ask questions like, "Where have we seen this before?", "Why do you think so?" eliminate possibilities **Reasoning/Proof:** examine patterns, draw reasonable conclusions, make and investigate conjectures, note regularities and irregularities **Connections:** use extended real world investigations connect mathematical expressions and technological and physical models to other curricular areas and outside classroom. **Communication:** clearly express mathematically ideas verbally and in writing, group discussion **Representations:** use technological representations, represent numerical, graphically and algebraically with the correct symbolic notation.	Use resources listed above. TEXTEAMS Algebra I: 2000 and Beyond, current events, pledge problem, stacking cups, mean temperatures, distance over time. CBRs. perimeter models, cost of services, walking rates, timers, connected scatter plots, saving money over time, cost per unit, simple interest See resources listed in October. graphing calculators, tables cooperative structures, centimeter cubes on centimeter paper, CBRs, calculators, tables equations and graphs Discuss meaning of intercepts in various situations
December	Algebra Algebra and Data Analysis Algebra	**2.3. 7** - Determine X and Y intercepts A. From a graph B. From an equation **2.3.8 -** Graph linear functions using X and Y intercepts **2.1.2 -** Represent equations in slope-intercept form (y=mx+b) **2.3.8 -** Graph linear functions by A. **2.3.8**, **5.1.1 -** Generating a table of values and plotting points B. Using slope-intercept form of an equation C. Using slope and any point on the line **2.3.6** - Explore how changing the value of m and b affects the graphs of linear relations	**Problem Solving:** reflect and evaluate mathematical thinking processes, make a model or simulation, tables, graphs, develop clarification, " How are these related?", Determine reasonableness of answer. **Reasoning/Proof:** look at patterns and make conjectures, link problem solving to the steps **Connections:** explore historical and multicultural contributions, establish connection among mathematical expressions, models, pictorial and real world situations. **Communication**: class and group discussions, use precise language and notation **Representations:** represent verbally, numerically, graphically, and algebraically use a variety of visual representations , graph paper and technology.	Calculators, graph paper, whiteboards, floor mat, grid paper CMP(Connected Math Project by Prentice Hall) real world linear data graphs graph paper, calculators NCTM Navigating Through Algebra Algebra Experiments (Key Curriculum) families of graphs, calculators, TI-Interactive

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January	Algebra Data Analysis And Measurement	**2.3.4 -** Identify the domain and range from a graph, equation, table and set of ordered pairs, and discuss appropriate domain and range for data **2.3.2 -** Write the equation of a line when given A. The graph of a line B. The slope and a point on the line C. A set of ordered pairs **2.1.2 -** Represent linear equations in standard form (Ax+By=C) **5.1.3 -** Interpret the correlation between two variables as being positive, negative or having no correlation **5.1.4 -** Explore line of best fit A. **4.1.3** - Find the line of best fit by estimation, choosing two points, and using technology for given sets of data B. **5.1.5 -** Analyze the meaning of the slope and Y-Intercept of a line of best fit as it relates to the data C. **5.1.6 -** Make predictions based on the line	**Problem Solving:** solve a related problem, look for a pattern, develop vocabulary, make a list table graph or equation, reflect and evaluate mathematical thinking processes. **Reasoning/Proof:** note regularities and irregularities of patterns, explain and justify **Connections:** use real-world situations and connect to other curricular areas **Communication:** organize and consolidate mathematical thinking **Representations:** represent problem situations verbally, numerically, graphically or algebraically using technology and appropriate symbolic notation	USA Today graphs, stock market, Sports Illustrated data, other graphs, tables and data real world linear graphs and data sets, student created data, time and temperature, CBR and calculators tables, graphs, equations, Box Cars and One-Eyed Jacks experiments
February	Algebra Geometry, Data Analysis Measurement Algebra, Geometry	**2.2.6 -** Solve common linear formulas and literal equations for a specified variable, e.g, solve for p in I=prt, r in d=rt, r in C=2pi*r, y in Ax+By = C **2.3.9 -** Graph linear inequalities and identify the boundary line and solution area **3.2.3, 5.1.1 -** Collect, record, organize, and display various sets of linear and nonlinear data including pi **5.1.2 -** Determine if the pattern of the data is linear or nonlinear when given in a list, table, and graph **3.2.1, 4.1.1 -** Find the approximate midpoint by measuring **3.2.1 -** Find the coordinates of a midpoint given two points **2.2.5, 3.3.1, 4.1.1, 4.1.3 -** Explore the Pythagorean Theorem and solve problems using the Theorem	**Problem Solving:** "How are these related?"; Look for a pattern; make a list, table, graph, or equation. **Reasoning/Proof:** examine patterns; make and investigate mathematical conjectures examining slope; justify eliminating possibilities **Connections:** find applications in other sources e.g. streets, cities, layouts; formulate real world situations **Communication:** class discussion; use precise language and rotation in verbal and written explanations **Representations**: represent problem situations verbally and in writing, express numerically, graphically and algebraically using technology	calculators, equations. See resources previously listed for real world applications various experiments and sets of data graph paper, rulers, measuring tapes, Geoboards, maps, various objects to measure coordinate plane centimeter cubes, geoboards, problems involving right triangles

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March	Algebra, Geometry and Measurement Number and Operation Geometry and Algebra Algebra	**2.2.5, 3.2.1 -** Find the distance between two points **3.2.2, 4.1.1 -** Solve problems using the distance formula **1.3.3 -** Simplify irrational numeric expression, e.g., $\sqrt{50}$ **1.3.2 -** Apply properties and operations in simplifying irrational expressions i.e, $3\pi + 2\pi$, $2\sqrt{20} - \sqrt{5}$ **3.3.2, 2.2.5 -** Find missing parts of geometric figures using proportional reasoning and geometric relationships **3.3.6 -** Determine if two lines are parallel, perpendicular, or neither given the equations. Connect to real world application **2.2.3, 2.2.4 -** Solve systems of two linear equations A. Graphically, estimate solutions to determine reasonableness B. Technology, estimating solutions C. **2.2.5 -** Numerically from a table and guess and check D. Algebraically, computing solutions	**Problem Solving:** check reasonableness of answer, reflect and evaluate mathematical thinking processes. Consider thinking strategies of others, use a model or simulation, make a list, tables, graphs, and evaluations. Solve a simpler or multi-step problem. How is this related to ideas before? **Reasoning/Proof:** justify sequence of steps, realize that extrapolating isn't proof **Connections:** use real-world situations newspapers, magazines, science data, explore historical contributions. **Communications:** group discussions, oral presentations, written reports. **Representations:** represent verbally, numerically, graphically, geometrically, and algebraically using technology, formulate conjectures, use physical models, visualizations, and appropriate symbolic notations.	real world graphs, tables, data sets ,calculators make connections between Pythagorean Formula and Distance Formula cooperative structures Two-Band Stretcher (see CMP) Graphing calculators Games, graphing calculators
April	Algebra Algebra and Number Sense Geometry and Measurement Data Analysis and Probability	**2.2.3 -** Solve systems of two inequalities A. Graphically, estimate solutions to determine reasonableness B. Technology, estimating solutions C. **2.2.5 -** Numerically from a table and guess and check D. Algebraically, computing solutions **3.3.3, 4.4.1 -** Illustrate multiplication of polynomials using area model, e.g., (a+b) ^2, x(x+2), (x+a)(x+b). **3.3.4 -** Use area models to factor polynomials A. Identify the greatest common monomial factor B. Find factors of the form ax^2+bx+c, when a=1 **5.2.1 -** Determine and express the probability of an event as a fraction, percent, ratio, and decimal **5.2.2 -** Identify the probability of an event as being between 0 and 1 **5.2.3 -** Recognize the sum of probability of an event and its complement is equal to 1.	**Problem Solving:** use proportional reasoning, look for patterns, make a model or simulations, make a list, table graph or equation, consider thinking strategies of others, multi-step problems, estimate determine reasonableness, use counter examples **Reasoning/Proof:** make conjectures , identify conclusion as valid or invalid, justify sequence of steps **Connections:** use physical models, pictorial representations and real world situations, connect models to mathematical expressions **Communication:** use precise language and notation, written and group discussion **Representation:** represent verbally, numerically, graphically, geometrically, and algebraically, use a variety of visual representations	Games. Graphing calculators calculators, graphs, tables tables and data AlgeBlocks AlgeBlocks probability games and simulations calculators, spinners, dice

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May	Data Analysis and Probability	**5.2. 4 -** Determine if a game or process is fair Review for CRT	**Problem Solving:** reflect and evaluate mathematical thinking processes, draw a picture or diagram, use a model or simulation, choose an appropriate operation, estimate solutions, consider the thinking of others **Reasoning/Proof:** explain patterns, explain regularities and irregularities, determine whether conclusions are valid or invalid make and investigate conjectures **Connections:** use real-world investigations, recognize and apply mathematical ideas and relationships in other curricular areas **Communications:** organize and consolidate mathematical thinking, group discussion, oral written reports using appropriate notation **Representations:** represent problem situations verbally, numerically, geometrically, or algebraically using technology, use visual representations , use correct notation Review for CRT	games and simulations Concentric circles